SELABS

Y8100

DC/AC Current Probe

Instruction Manual

FLUKE®

Y8100
DC/AC Current Probe

Instruction Manual

P/N 534271
February 1980
Rev. 1 10/83
©1983, John Fluke Mfg. Co., Inc., all rights reserved. Litho in U.S.A.

FLUKE®

Y8100
DC/AC
Current Probe

Table of Contents

SECTION	TITLE	PAGE
1	**INTRODUCTION AND SPECIFICATIONS**	1-1
	1-1. DESCRIPTION	1-1
	1-5. FEATURES	1-2
	1-7. UNPACKING	1-4
2	**OPERATING INSTRUCTIONS**	2-1
	2-1. INTRODUCTION	2-1
	2-3. SAFETY HINTS	2-1
	2-4. MEASUREMENT NOTES	2-1
	2-5. MEASURING AC CURRENT	2-3
	2-6. MEASURING DC CURRENT	2-3
	2-7. MEASURING COMPOSITE (AC-ON-DC) CURRENT	2-4
3	**THEORY OF OPERATION**	3-1
	3-1. INTRODUCTION	3-1
4	**MAINTENANCE**	4-1
	4-1. INTRODUCTION	4-1
	4-3. BATTERY INSTALLATION	4-1
	4-6. CALIBRATION	4-2
	4-12. DEMAGNETIZING CIRCUIT CHECK PROCEDURE	4-6
	4-13. TROUBLESHOOTING	4-6
5	**LIST OF REPLACEABLE PARTS**	5-1
	5-1. INTRODUCTION	5-1
	5-3. HOW TO OBTAIN PARTS	5-1
6	**SCHEMATIC DIAGRAMS**	6-1

List of Tables

TABLE	TITLE	PAGE
1-1.	Specifications	1-4
4-1.	Calibration Equipment	4-3
4-2.	Troubleshooting Guide	4-7
5-1.	Final Assembly	5-2
5-2.	A1 PCB Assembly	5-4

List of Illustrations

FIGURE	TITLE	PAGE
1-1.	Fluke Y8100 DC AC Current Probe	1-3
4-1.	Battery Cover	4-2
4-2.	Trim Adjustments Locations	4-3
4-3.	Calibration Setups	4-4
5-1.	A1 PCB Assembly	5-6

Section 1

Introduction and Specifications

1-1. DESCRIPTION

1-2. The Fluke Y8100 DC/AC Current Probe is a clamp-on probe that is used with a voltmeter, multimeter, or oscilloscope to read dc, ac, or composite (ac on dc) current measurements. The jaws on the Y8100 are designed to clamp around conductors up to ¼ inch in diameter. The pistol shape allows safe, easy, one-hand operation when making current measurements.

1-3. APPLICATIONS

1-4. The Y8100 can be used to measure any of the following:

. Ground currents ac and dc.

. Power supply ripple.

. Current distribution in multiple systems.

. Current balance in two wires ac and dc.

. Current in audio distribution systems (using 440 to 1000 Hz signals).

. Starting currents without introducing impedance (imparts negligible inductance in the mH range).

. Transformer currents

. Battery currents

. Current distribution and perform ripple current tests in plating operations.

. Current transients (dc to 1 kHz) when used with an oscilloscope.

1-5. FEATURES

1-6. As shown in Figure 1-1, major features of the Y8100 include the following. Table 1-1 provides the specifications for the Y8100.

1. Jaws - The jaws can enclose conductors up to ¾ inch (19 mm) in diameter. Except at the core closure, the jaws are insulated. The closure is chamfered for positive alignment and minimum air gap. The jaws are rated for voltages up to 600V dc or 480V ac. Inspect core closure area frequently for foreign material. Centering of conductors smaller than ¾ inch in diameter is desireable, but not critical for specified accuracy.

WARNING

Do not use at voltages above 600V dc or 480V ac. Avoid snapping the jaws as that could damage the core.

2. Jaw Trigger - The jaw trigger is designed for easy, one-hand operation and positioned for maximum protection from circuit voltages.

3. Slide Lock - The slide lock mechanically locks the push-to-read switch in the on or off position.

4. Push-To-Read- Switch - The push-to-read switch turns the Y8100 on for zeroing and measurement. Switch operation also demagnetizes the core.

5. Output Banana Jacks - The output banana jacks are color coded red for positive and black for negative with reference to the current direction arrow. They will accept standard dual banana connector plugs or individual banana plug leads.

6. Connection Cable - A 5-foot cable with standard dual banana connectors is supplied. A molded tab indicates the negative lead on the connectors.

7. Battery Compartment - The battery compartment can be reached by removing the butt plate, which is held in place by a single phillips screw. Contained in the battery compartment is the battery holder, which slides out to accept four "AA" alkaline batteries (6 volts) required for operation of the Y8100.

NOTE

Support the battery holder when removing it to prevent unnecessary stress on the flexible leads connected to the unit. Cell polarity is molded into the battery holder and should be carefully observed when installing batteries.

8. Zero Adjustment Thumbwheel - Used to zero the voltage output from the Y8100 on the meter before taking current readings.

9. Battery-Low Indicator Light - Lights whenever battery voltage falls below that required for proper operation. Alkaline battery life under continuous operation is approximately 20 hours.

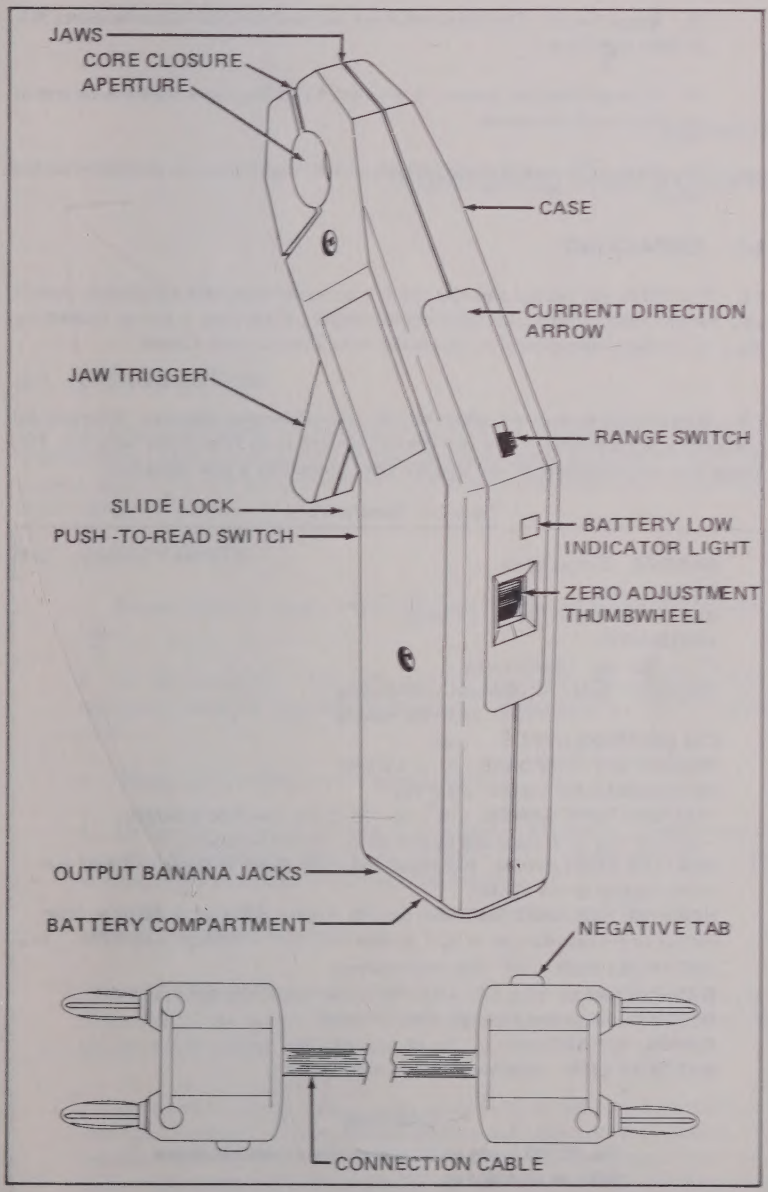


Figure 1-1. Fluke Y8100 DC/AC Current Probe

10. Range Switch - The range switch is a two position slide switch for either 20A or 200A operation.

11. Current Direction Arrow - A positive (+) reading on dc indicates current in the direction of the arrow.

12. Case - The case is made of high-impact, high-dielectric, precision-molded plastic.

1-7. UNPACKING

1-8. The Y8100 was packed and shipped in a container especially designed to protect your current probe. Check your shipment thoroughly. If anything is wrong, contact the place of purchase immediately or the nearest John Fluke Service Center.

1-9. If reshipment is necessary, please use the original shipping container. If the original container is not available, a new one can be obtained from John Fluke Mfg. Co., Inc. Please give the instrument model number when requesting a new container.

Table 1-1. Specifications

RANGES: 20A ac or dc
200A ac or dc
RATED OUTPUT: 2V at full range
ACCURACY:
DC to 200 Hz: ±2% of range
200 Hz to 1 kHz: <100A add ±3% reading
>100A add +6% reading
CALIBRATION CYCLE: 1 year
FREQUENCY RESPONSE: dc to 1.0 kHz
RECOMMENDED LOAD: ≥3.0 kΩ
TEMPERATURE RANGE: +15°C to +35°C; for specified accuracy
−10°C to +50°C; storage and operation at reduced accuracy.
HEATING LIMITATION: Prolonged operation above 200A ac or 1 kHz can cause damage to the Y8100.
WORKING VOLTAGE RATING: Core to output; 600V dc or 480V ac Max output to ground; 42V dc or 30V ac Max
APERTURE SIZE: 3/4" (19 mm) diameter
SIZE-OVERALL: 9" x 4½" x 1-7/16" (230 mm x 115 mm x 37 mm)
WEIGHT: 14 ounces (0.4 kg), with batteries
POWER: 4; "AA" cells
BATTERY LIFE: Alkaline-20 hours continuous

CAUTION

The Y8100 is not to be used at circuit voltages above 600V dc or 480V ac.

Section 2

Operating Instructions

2-1. INTRODUCTION

2-2. The following measurement techniques are provided as guidelines to be followed when using the Y8100. Included are procedures for measuring ac, dc, composite (ac on dc) currents, safety hints, and measurement notes. These procedures should be read carefully before using the Y8100.

2-3. SAFETY HINTS

1. Remove batteries when not using the current probe for an extended period of time.

2. Do not clamp the probe onto anything other than the conductor being measured. The probe may hang from aperture if necessary to read the remote meter.

3. Observe all maximum circuit voltage warnings.

4. The aperture is insulated except at core closure. Withstand voltage from core to output terminals and case is safe for the working voltage specified. Avoid touching uninsulated core closure area to conductor.

2-4. MEASUREMENT NOTES

1. There can be a few millivolts of thermal drift during the first 60 to 120 seconds of warmup of the current probe. For maximum dc accuracy, a warmup of 60 seconds before zeroing will eliminate 90-95% of the drift.

2. The Earth's magnetic field is an influence to be zeroed out before taking dc readings. Depending on geographical location and immediate environment, the magnitude of error current indication can be ±200 mA. Being careful to zero and read with the probe at the same angle and orientation will minimize any error from this influence.

3. It is not possible to totally zero the output of the current probe in ac measurements, due to pick-up of stray ac fields and a small amount of normal amplifier noise. This output is typically 1.0 to 5.0 mV reflecting 20 mA to 200 mA on the 20A range.

4. When using a meter which does not provide dc blocking on ac ranges, the dc zeroing procedure should be followed to obtain a minimum reading on the meter (it may not be possible to completely zero the output, as explained in note 3, above.) Alternately, at 60 Hz and higher frequencies, the dc may be blocked by use of a non-polarized capacitor with a 50 mfd, 5V rating in series with the positive (red) lead from the current probe.

5. Where possible, when reading low ac or dc current, looping a number of turns of the conductor through the aperture will multiply the sensitivity of the reading. Note that this will not cause multiplication of the influences that tend to produce errors. To obtain the actual current, the reading on the meter must be divided by the total number of turns through the aperture (use a higher scale on the meter when necessary to prevent going off scale).

6. Make certain that the core closes completely on larger conductors, ¾ inch diameter maximum.

7. Keep core closure area clean of foreign material.

CAUTION

The current probe, although designed for rugged use, is a precision measurment tool. Do not snap jaws, doing so may damage the core and/or alter the zero set on dc.

8. Conductors smaller than ¾ inch should be centered in the aperture for maximum accuracy. However, conductor position within the aperture is not critical in attaining the accuracy of ±2.0% of range. Overall accuracy is determined by adding the error of the indicating instrument to that of the probe. Measurement of high dc currents, exposure to large transient currents, or turning the Y8100 or the source current off while the probe is clamped around a conductor carrying current may result in a small residual magnetic field in the core. Before attempting to read lower dc currents, this potential cause for error in readings should be eliminated by removing the unit from the conductor, and turning it on and off a few times (this will demagnetize the core) and then repeating the zeroing steps. When practical, this procedure is recommended for all dc measurements and is good practice for any current measurement.

9. Rated voltage between the uninsulated core closure and the output terminals will protect any connected equipment when used in circuits up to 600V dc or 480V ac.

WARNING

Do not use the Y8100 on voltages exceeding 600V dc or 480V ac.

2-5. MEASURING AC CURRENT

1. Select a voltmeter (input impedance ≥3k ohm).

2. Connect current probe to voltmeter with banana plug cable supplied, or other appropriate cable.

3. Select 20A or 200A range on current probe using the range switch.

4. Turn voltmeter on. Select proper ac voltage range (full-scale readings will go to 2.0V.) Determine scale factors: i.e., mA or amps/meter division.

5. Turn current probe on using push-to-read switch. If desired, lock on using the slide lock.

6. Select a spot along the conductor to be measured where the influence of stray fields from adjacent conductors and large ferrous objects is at a minimum.

7. Use Jaw Trigger to open jaws and clamp around conductor.

8. Read current indication on meter. Observe proper scale factor.

WARNING

Do not measure circuits over 480V ac.

2-6. MEASURING DC CURRENT

1. Select a voltmeter (input impedance ≥3k ohm.)

2. Connect current probe to voltmeter with banana plug cable supplied, or an equivalent appropriate cable.

3. Select 20A or 200A range on current probe using the Range Switch.

4. Turn voltmeter on.

5. Select suitable dc voltage range on the voltmeter (full-scale will go to 2.0V).

6. Turn current probe on with push-to-read switch. Lock on with slide lock.

7. Select a spot along the conductor to be measured where the influence of stray fields from adjacent conductors and large ferrous objects is at a minimum.

8. Hold the current probe at right angles to the conductor 2 to 4 inches away from the selected spot at the same angle and orientation as will be used for final reading.

9. Zero the output of the current probe on the voltmeter using the zero adjustment thumbwheel. Output may be either + or –.

10. Leave the current probe turned on.

11. Use jaw trigger to open jaws and clamp around conductor.

CAUTION

Release jaw trigger gently. Allowing the jaws to snap closed may alter the zero set.

12. Read current on meter. Observe proper scale factor.

WARNING

Do not measure on circuits over 600V dc.

13. To accurately measure low dc currents after measurement of a higher dc current, exposure to large transient currents, or if the current probe, or the source current has been turned off while still clamped around a conductor carrying current, remove the current probe from the conductor, turn it on and off a few times to demagnetize the core and repeat zeroing steps numbers 4 through 10 above.

2-7. MEASURING COMPOSITE (AC-ON-DC) CURRENT

1. To measure the dc component of the composite current, proceed as if measuring dc currents.

2. Switch the voltmeter to a proper ac voltage range to measure the ac (ripple) component of the composite current. The meter must provide dc blocking (see "measurement note" number 4).

Section 3

Theory of Operation

3-1. INTRODUCTION

3-2. A magnetic field is generated around a current-carrying conductor with a strength and direction directly proportional to the magnitude and polarity of the current (ampere's law). The Y8100 Current Probe concentrates that field in a magnetic core built into it's jaws. The field is measured with a Hall-effect device mounted in a narrow air-gap in the core. A Hall-effect device is a small semiconductor that produces an output voltage directly proportional to the strength and direction of a magnetic field into which it is placed. The voltage output of the Y8100 is then an accurate analog voltage equivalent to the ac, dc, or composite (ac-on-dc) current in the conductor, amplified and scaled for 2V full-scale to a voltmeter.

Section 4

Maintenance

WARNING

THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

4-1. INTRODUCTION

4-2. Included in this section are procedures for battery installation, calibration, and troubleshooting. General maintenance of the Y8100 includes periodic cleaning and inspection. To clean, wipe the unit with a damp cloth, make sure the core and aperture are kept free from dirt and foreign substances.

4-3. BATTERY INSTALLATION

CAUTION

If the Y8100 is not to be used for an extended period, it is recommended that the batteries be removed to protect the unit.

4-4. There are four "AA" alkaline batteries that supply +6V operating power for the Y8100. (See Figure 4-1). A "batteries low" indicator light, located just above the "zero adjustment thumbwheel," will come on whenever the batteries require replacement.

4-5. To install new batteries, remove the battery cover (butt plate) by unscrewing the single phillips screw. Carefully remove the plastic battery holder being sure not to pull too hard and loosen or disconnect the two flexible leads to the unit. The battery holder has cell polarity indicator marks (+) (—) to ensure proper installation of the four new batteries. Install the batteries as indicated on the battery holder and carefully insert the encased batteries back in the handle. Install the battery cover (butt plate).

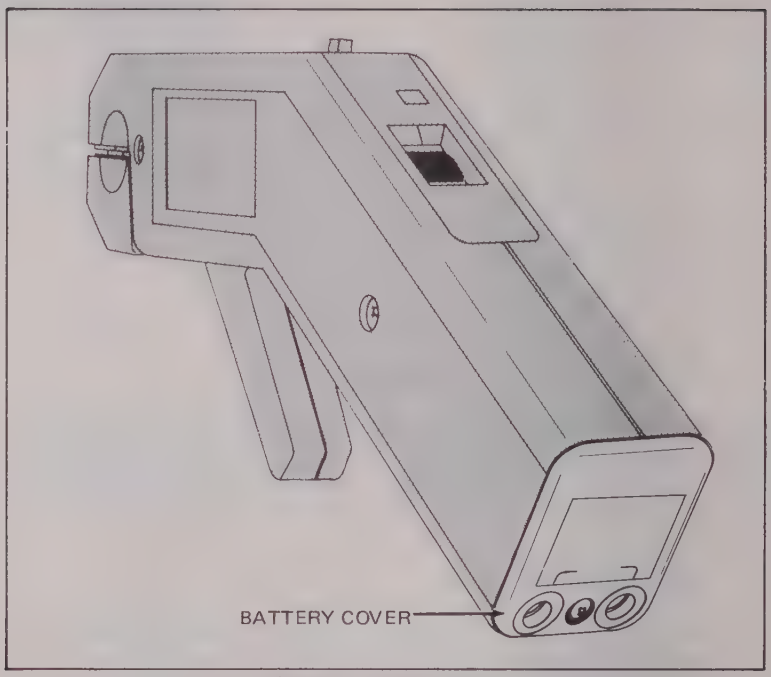


Figure 4-1. Battery Cover

4-6. CALIBRATION

4-7. Complete calibration of the Model Y8100 Current Probe is accomplished by adjusting four potentiometers. As illustrated in Figure 4-2, all four potentiometers are accessible through holes in the plastic case under the two decals.

4-8. EQUIPMENT REQUIRED

4-9. Table 4-1 lists the equipment required to perform the calibration adjustment procedures.

4-10. ADJUSTMENT PROCEDURES

4-11. The four adjustments are (1) ac response, (2) coarse dc zero, (3) 20 amp range calibration, and (4) 200 amp range calibration. Instructions for each adjustment ends with a limit that represents the specification listed in Table 1-1 of this manual for that measurement. It is suggested that all four measurements be checked for need of re-adjustment before removing one or both decals. These limits can also be used as an acceptance test on receiving the probe. See Figure 4-3 for calibration set ups.

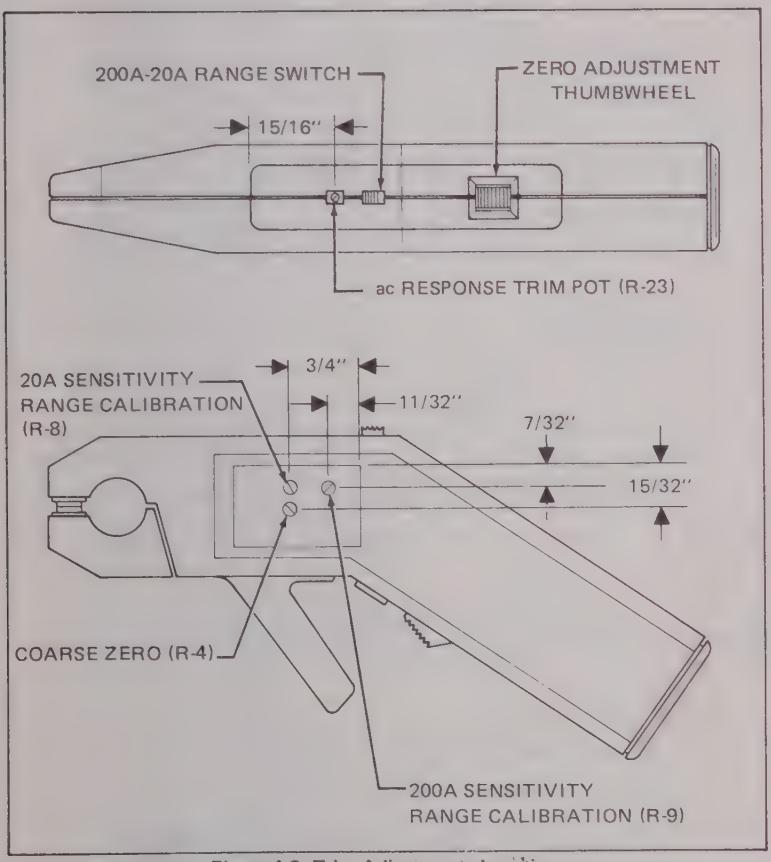


Figure 4-2. Trim Adjustments Locations

Table 4-1. Calibration Equipment

INSTRUMENT TYPE	RECOMMENDED	REQUIREMENT
AC-DC Current Calibrator	JF 5100A and JF 5220A	.3%, 2 amps to 20 amps dc, and 50 Hz to 1 kHz
Digital Multimeter	JF 8600A	.25% ac and dc volts
2 Wire Coils	1 and 10 turns no. 14 varnished	15 to 18 in. dia.

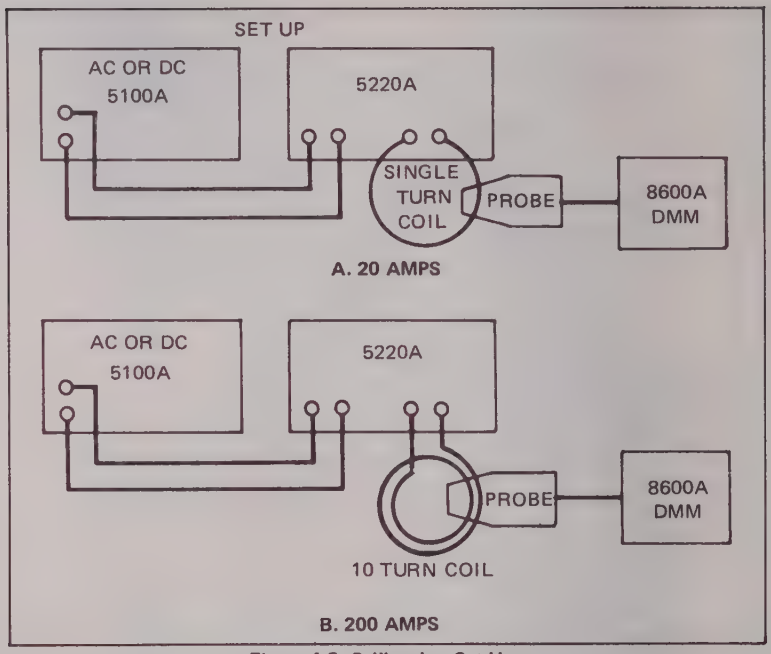


Figure 4-3. Calibration Set Ups

1. AC response adjustments.

   a. Turn the Y8100 on and lock with the slide lock.

   b. Set the range switch to the 200A position.

   c. Clamp the Y8100 around the single turn coil (see Figure 4-3).

   d. Set the ac current source at 50 Hz, for 0.200 ±1 mV reading on the DMM.

   e. Change the source to 1 kHz without changing level adjustments.

   f. Adjust the ac response trimming potentiometer for .198 ±.001 on the DMM. (The specification is represented by a reading of .200 ±.006V).

NOTE

If a large change from the original factory setting of the trimming potentiometer has been necessary at 1 kHz, the adjustment sequence should be repeated.

2. Coarse dc zero adjustment.

   a. Turn the Y8100 on and lock with the slide lock.

b. Set the range switch to the 200A position.

c. Connect the Y8100 output to the DMM and set to the 2V dc voltage range.

d. Adjust the coarse dc zero trimming potentiometer until a numerically equal positive and negative dc voltage reading is obtained at each end-stop of the zero adjustment thumbwheel. If zero adjustment occurs well within the thumbwheel range, internal adjustment is not required.

NOTE

Typical current adjustment span of the zero adjustment thumbwheel is +5A to -5A (10A total), which will be +0.050V to -0.050V (0.100V total) on the DMM for the 200A range setting.

3. 20A range calibration adjustment.

a. Turn the Y8100 on and lock with the slide lock.

b. Set the Y8100 range switch to the 20A position.

c. Set the ac current source to 18A at 50 Hz.

d. Clamp the Y8100 around the one turn coil, as shown in Figure 4-3-A.

e. Connect the voltage output of the Y8100 to the DMM and set to the 2V ac range.

f. Adjust the 20A calibration trimming potentiometer for 1.800 ±.005V ac reading on the DMM (the specification is represented by a reading of 1.80 ±.04V).

4. 200A range calibration adjustment.

a. Turn the Y8100 on and lock with the slide lock.

b. Set the Y8100 range switch to the 200A position.

c. Set the dc current source to 0.0A (turn-off).

d. Clamp the Y8100 around the ten-turn coil (see Figure 4-3-B).

e. Connect the voltage output of the Y8100 to the DMM and select the 2V dc range.

f. Zero the voltage output of the Y8100 on the DMM using the zero adjustment thumbwheel.

g. Slowly increase the dc source current to 18A dc, this is the equivalent of 180A dc when clamped on the ten-turn coil.

h. Adjust the 200A calibration trimming potentiometer for a +1.800 ±.005V dc reading on the DMM.

i. To verify calibration, remove the Y8100 from the coil, turn it on and off once or twice to demagnatize the core, and repeat steps "a" through "h". (The specification is represented by a reading of 1.800 ±.04V).

NOTE

The Y8100 should be zeroed and calibrated while being held as closely as possible to the same angle and orientation to avoid introducing a small incremental error due to the Earth's magnetic field.

j. Cover adjustment opening with a new set of decals. These are included with your calibration kit or may be obtained from John Fluke Mfg. Co., Inc.

4-12. DEMAGNETIZING CIRCUIT CHECK PROCEDURE

1. Set the dc current source to 0.0A (turn off).

2. Turn the Y8100 on and lock with the slide lock.

3. Clamp the Y8100 around the ten-turn coil (see Figure 4-3-B).

4. Connect the voltage output of the DMM and set to a low dc range.

5. Zero the voltage output of the Y8100 on the DMM.

6. Turn the dc current source on and adjust for approximately 10A.

7. Turn the current source off.

8. Notice a positive voltage offset in the Y8100 output to the DMM due to a small residual flux in the magnetic core.

9. Turn the Y8100 off and on. The offset should return to a zero reading ±.005V.

4-13. TROUBLESHOOTING

4-14. Before referencing the following troubleshooting guide for the Y8100, check the obvious potential source of problems such as the ON/OFF switches, power source (batteries), and loose or incorrect connections on the Y8100 and peripheral equipment.

4-15. The following troubleshooting guide (Table 4-2) is keyed to the Y8100 schematic (Section 6) and presented by test and symptom with the related possible cause shown in the right-hand column of the chart.

CAUTION

If it is determined that the core, coil, or sensor is defective, return the probe to the John Fluke Factory for repair, either directly or through a John Fluke Field Service Center. These parts are not field replaceable parts.

Table 4-2. Troubleshooting Guide

TEST AND SYMPTOM	POSSIBLE CAUSE
1. Initial Procedure Low battery indicator is on when unit is turn on.	Low batteries, Q2, Q3
No output at output jacks and low battery indicator off.	Dead batteries, CR1
2. Output Tests (No Input Current) Cannot vary output with thumb zero knob.	1. No −V supply (−3.0 to −4.5V dc) IC2, CR2, CR3, C2, C3 2. No Hall generator control current. Check voltage across R17 = 0.35V dc ±15%, if not check IC1, CE-1, Q1, *open HG-1 (should be 40Ω to 120Ω measured from red to black lead of HG-1)
DC output voltage continues to drift after unit is turned on.	Defective HG-1
Cannot zero output with thumb zero knob.	Coarse zero out at Cal, IC1, HG-1
Output ≥±3.0V dc and cannot adjust with thumb zero knob or coarse zero.	IC1,HG-1**
Excessive noise at output (should be <3.0 mV ac on the 20A range).	IC1,HG-1**
3. Core Demagnetizing Test Turning unit on and off does not remove dc residual in the core (typcial <0.2A).	S2, S3, C1, L1
4. AC or DC Current Test Output reading out of tolerance on 20A range	R8 out of calibration (see Amplifier Gain Test).
Output reading out of tolerance on 200A range.	R9 out of calibration (see Amplifier Gain Test).

Table 4-2. Troubleshooting Guide (cont)

TEST AND SYMPTOM	POSSIBLE CAUSE
5. Amplifier Gain Test With unit in proper calibration, positive to negative swing of thumb zero control is greater than 15V dc on the 20A or 200A range.	Excessive amplifier gain caused by: a) poor core alignment at core closure area b) foreign material on surface of closure area c) Hall Generator not properly installed in core gap d) Improper Hall Generator Control Current (see control current check under Output tests)
6. Frequency Test Output reading correct at 60 Hz, but out of tolerance at 1 kHz on the 200A range.	R23 out of calibration, L2 open
*—If the Hall generator is open, shorting the Control Current leads (Point 3 and 4 at the printed circuit board) will cause the correct voltage reading across R17 (0.35V±15%).	
**—If the Hall generator is defective, shorting the Hall Voltage leads (Points 5 and 6 at the printed circuit board) will cause a zero output voltage to be obtainable by adjustment of the thumb or coarse zero controls. the noise level on the output will decrease to <3.0 mV ac on the 10A range.	

Section 5
List of Replaceable Parts

5-1. INTRODUCTION

5-2. This section contains information on how to obtain parts and a parts list, which describes the part, gives the part number and recommended quantity.

5-3. HOW TO OBTAIN PARTS

5-4. Parts may be ordered from the factory or authorized representative by using the Fluke Stock Number. To ensure prompt and efficient handling of you order, include the following information:

1. Quantity
2. Fluke Stock Number
3. Description
4. Reference Designation
5. Instrument Model and Serial Number.

5-5. The Y8100 is warranted for a period of 1 year, upon delivery to the original purchaser. Conditions of the warranty are given at the end of this manual.

Table 5-1. Final Assembly

REF DES	DESCRIPTION	FLUKE STOCK NO.	MFG SPLY CODE	MFG PART NO. OR TYPE	TOT QTY	REC QTY	NOTE
	Y8100 DC/AC CURRENT PROBE						
A1	MAIN & POWER PCB ASSEMBLIES	542381	89536	542381	1		
B1-B4	BATTERY, 1.5V ALK, AA	376756	83740	E91NEDA15A	4		
	HARDWARE						
	SCREW, 3-24 X .313	542514	89536	542514	2		
	SCREW, 4-24 X .313	542522	89536	542522	2		
	SCREW, 4-40 X .75	542530	89536	542530	2		
	SCREW, 4-20 X .75	542548	89536	542548	2		
	HINGE PIN	542555	89536	542555	2		
	SCREW, 6-19 X .875	542563	89536	542563	2		
	SCREW, 6-19 X 1.0	542571	89536	542571	2		
	NUT, 4-40 X .25	542589	89536	542589	2		
	WASHER, FIBER	542597	89536	542597	2		
J1	CONNECTOR, BANANA, RED (NOT SHOWN)	542423	89536	542423	1		
J2	CONNECTOR, BANANA, BLACK (NOT SHOWN)	542431	89536	542431	1		
MP1	DECAL (FUNCTION)	534511	89536	534511	1		A
MP2	DECAL (LOAD/MODEL)	534503	89536	534503	1		B
MP3	DECAL, BACK COVER	534529	89536	534529	1		
MP4	BUTTON, SWITCH (TO S2, S3)	542472	89536	542472	1		
MP5	BUTTON, TRIGGER LOCK	542480	89536	542480	1		

REF DES	DESCRIPTION	FLUKE STOCK NO.	MFG SPLY CODE	MFG PART NO. OR TYPE	TOT QTY	REC QTY	NOTE
MP6	COVER, BACK/REAR	542498	89536	542498	1		
MP7	KNOB, POT (TO R23)	542506	89536	542506	1		
MP8	SPRING, SWITCH	542605	89536	542605	1		
MP9	SPRING TRIGGER	542613	89536	542613	1		
MP10	HOLDER, BATTERY	542464	89536	542464	1		
MP11	OUTPUT CABLE	543900	89536	543900	1		

A THE FUNCTION LABEL MUST BE REPLACED IF THE UNIT IS OPENED.

B THE LOAD/MODEL LABEL MUST BE TAKEN OFF AND REPLACED WHEN THE UNIT IS CALIBRATED.

Table 5-1. Final Assembly (cont)

Table 5-2. A1, PCB Assembly

REF DES	DESCRIPTION	FLUKE STOCK NO.	MFG SPLY CODE	MFG PART NO.	TOT QTY	REC QTY	NOTE
A1	MAIN & POWER PCB ASSEMBLIES FIGURE 5-1	ORDER	ONLY	REPLACEABLE PARTS	REF		
C1	CAP, ELECT. 22 UF, 10V	542365	89536	542365	3		
C2	CAP, ELECT. 22 UF, 10V	542365	89536	542365	REF		
C3	CAP, ELECT. 22 UF, 10V	542365	89536	542365	REF		
C4	CAP, CER. 270 PF	542373	89536	542373	1		
CR1	DIODE. GERMANIUM	149187	80131	1N270	1	1	
CR2	DIODE. GERMANIUM	149187	80131	1N270	2	1	
CR3	DIODE. GERMANIUM	149187	80131	1N270	REF		
CR4	DIODE. LIGHT EMITTING (LED)	542407	89536	542407	1	1	
HG-1	CORE ASSEMBLY		SEE	FOOTNOTE "A"			A
L1							
L2							
Q1	XSTR, SI, PNP	215897	89536	215897	1		
Q2	TRANSISTOR	542399	89536	542399	2	1	
Q3	TRANSISTOR	542399	89536	542399	REF		
R1	RES, MTL. FILM, 909 +/-1%, 1/8W	312629	91637	MFF1-89090F	1		
R2	RES, MTL. FILM, 59K +/-1%, 1/8W	261677	91637	MFF1-85902F	1		
R3	RES, PANEL MTG (POT) 200	542332	89536	542332	1		
R4	RES, CER (POT) 5K, COARSE ZERO	542357	89536	542357	2		
R5	RES, MTL. FILM, 54.9K +/-1%, 1/8W	271353	91637	MFF1-85492F	1		
R6	RES, MTL. FILM, 49.9K +/-1%, 1/8W	268821	91637	MFF1-84992F	2		
R7	RES, MTL. FILM, 49.9K +/-1%, 1/8W	268821	91637	MFF1-84992F	REF		

Table 5-2. A1, PCB Assembly (cont)

REF DES	DESCRIPTION	FLUKE STOCK NO.	MFG SPLY CODE	MFG PART NO.	TOT QTY	REC QTY	NOTE
R8	RES, CER (POT) 5K SENSITIVITY RANGE CAL.	542357	89536	542357	REF		
R9	RES, CER (POT) 50K, SENSITIVITY RANGE	542340	89536	542340	1		
R10	RES, MTL. FILM, 24.9K +/-1%, 1/8W	291369	91637	MFF1-82492F	2		
R11	RES, MTL. FILM, 24.9K +/-1%, 1/8W	291369	91637	MFF1-82492F	REF		
R12	RES, MTL. FILM, 100K +/-1%, 1/8W	248807	91637	MFF1-81003F	2		
R13	RES, MTL. FILM, 100K +/-1%, 1/8W	248807	91637	MFF1-81003F	REF		
R14	RES, COMP, 3.6K +/-5%, 1/4W	241620	01121	EB3625	1		
R15	RES, MTL. FILM, 1.3K +/-1%, 1/8W	343921	91637	MFF1-81301F	1		
R16	RES, COMP, 6.2K +/-5%, 1/4W	221911	01121	EB6225	1		
R17	RES, SELECTED, TYPICALLY 14.7 OHM				1		
R18	RES, COMP. 1M +/-5%, 1/4W	182204	01121	CB1055	1		
R19	RES, COMP, 510K +/-5%, 1/4W	275685	01121	CB5145	1		
R20	RES, COMP, 1.6K +/-5%, 1/4W	266197	01121	CB1625	1		
R21	RES, COMP, 9.1K +/-5%, 1/4W	193318	01121	CB1035	2		
R22	RES, COMP, 20K +/-5%, 1/4W	221614	01121	CB1035	1		
R23	RES, CER (POT) 100 +/-10% AC RESPONSE	542324	89536	542324	1		
R24	RES, COMP, 2.2K +/-5%, 1/4W	148049	01121	CB2225	1		
S1	SWITCH. SLIDE. DPDT. RANGE	542449	89536	542449	1	1	
S2	SWITCH. SNAP ACTION, ZERO ADJUST	542456	89536	542456	2		
S3	SWITCH. SNAP ACTION, ZERO ADJUST	542456	89536	542456	REF		
U1	IC, LIN. QUAD OP AMP	402669	12040	LM324N	1	1	
U2	IC, HEX INTR "CMDS"	404681	89536	404681	1	1	
VR1	IC, LOW VOLTAGE REF	720698	89536	720698	1	1	

A IF THE CORE, COIL, OR HALL GENERATOR IS DAMAGED OR FAILS, RETURN TO THE FACTORY OR AUTHORIZED SERVICE CENTER. THESE ARE NOT FIELD REPLACABLE PARTS.(ILLUSTRATED IN SECTION 6)

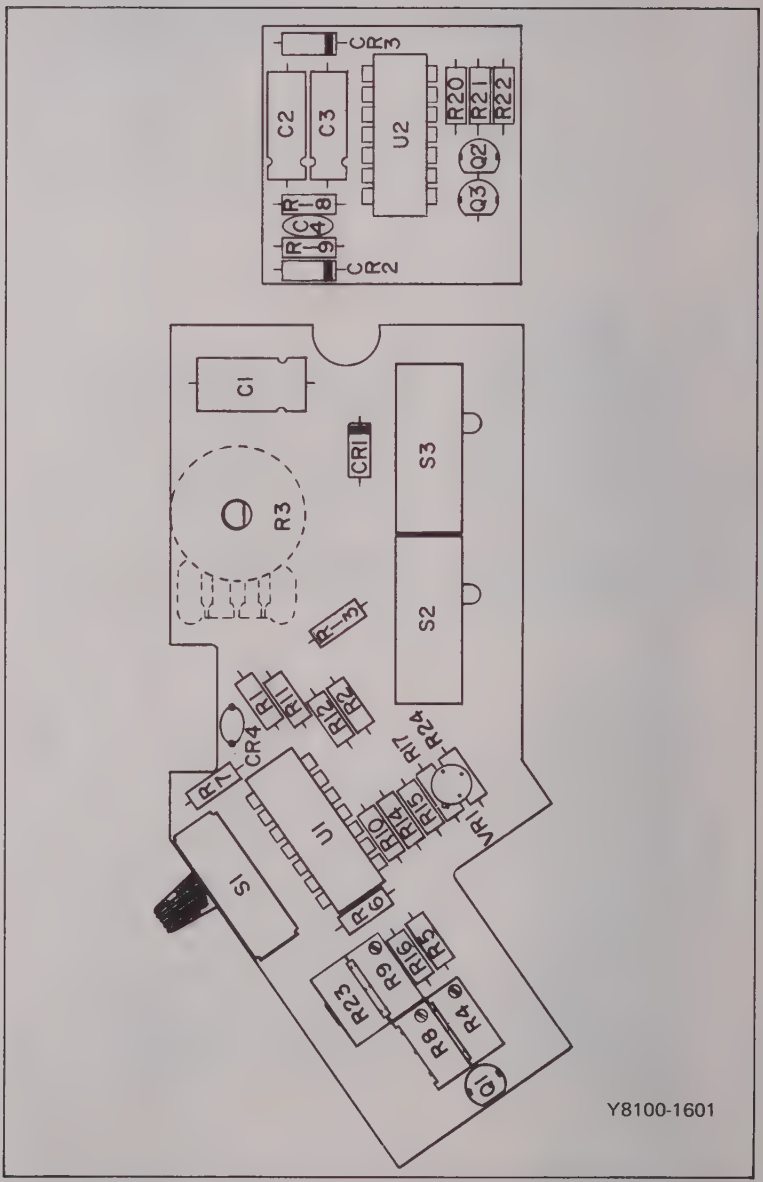


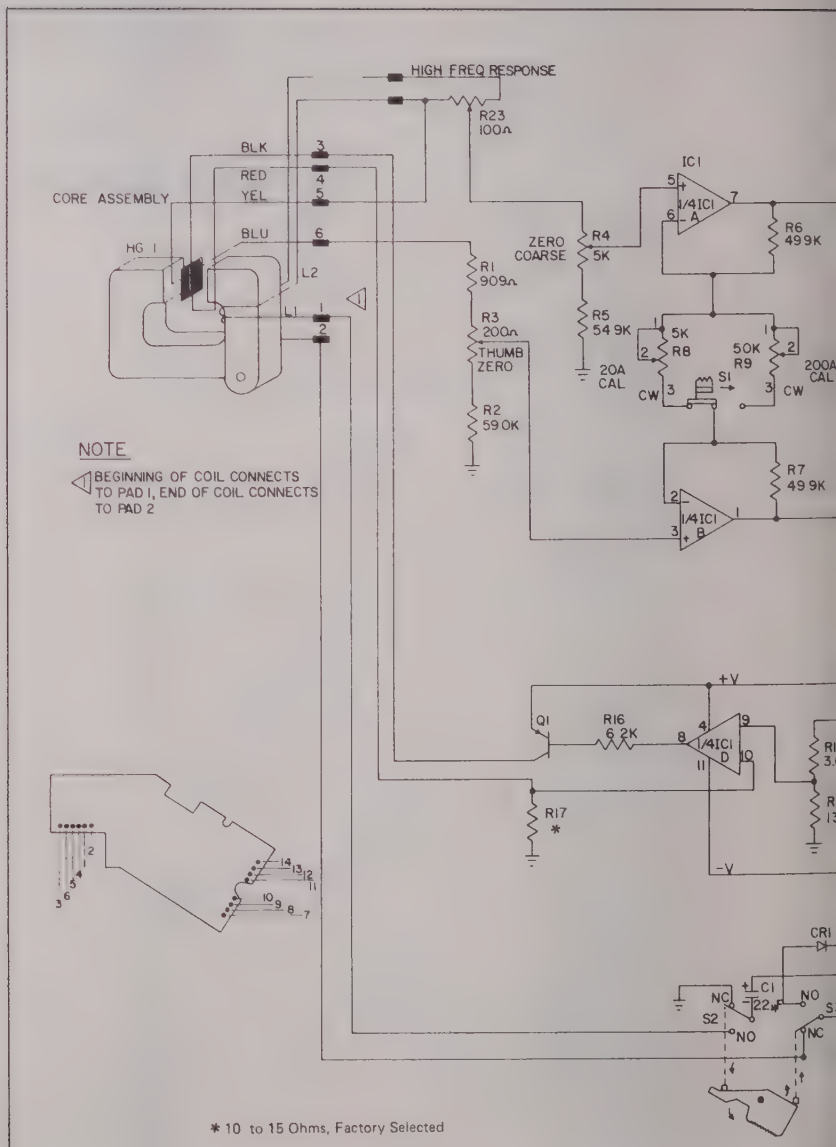
Figure 5-1. A1,PCB Assembly

Section 6

Schematic Diagrams

TABLE OF CONTENTS

FIGURE	TITLE	PAGE
6-1.	Y8100 Schematic	6-2


HIGH FREQ RESPONSE
R23
100Ω
BLK
RED
YEL
BLU
CORE ASSEMBLY
HG 1
L2
L1
IC1
1/4IC1
A
R6
499K
ZERO
COARSE
R4
5K
R1
909Ω
R3
200Ω
THUMB
ZERO
R5
549K
20A
CAL
5K
R8
CW
50K
R9
S1
200A
CAL
R2
590K
NOTE
BEGINNING OF COIL CONNECTS TO PAD 1, END OF COIL CONNECTS TO PAD 2
R7
499K
1/4IC1
B
+V
Q1
R16
6.2K
1/4IC1
D
R17
*
-V
CR1
LC1
22μH
NC
NO
S2
NO
NC
* 10 to 15 Ohms, Factory Selected

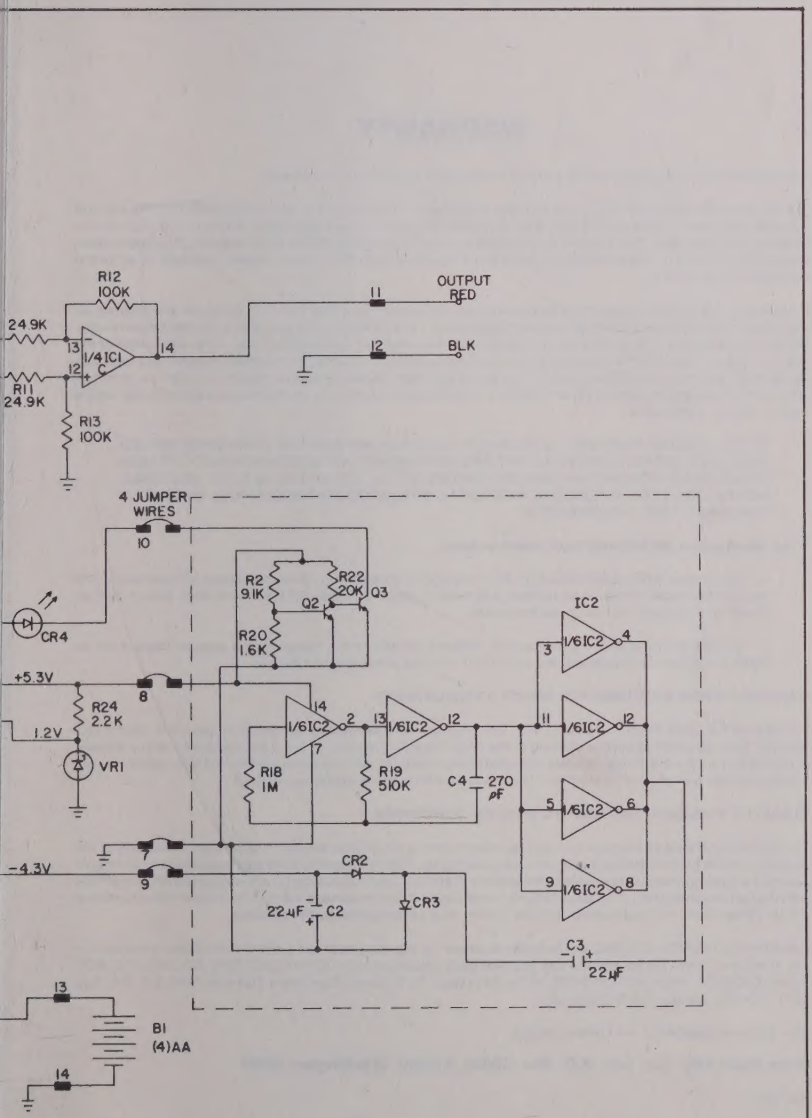


Figure 6-1. Y8100 Schematic

WARRANTY

Notwithstanding any provision of any agreement the following warranty is exclusive:

The JOHN FLUKE MFG. CO., INC., warrants each instrument it manufactures to be free from defects in material and workmanship under normal use and service for the period of 1-year from date of purchase. This warranty extends only to the original purchaser. This warranty shall not apply to fuses, disposable batteries (rechargeable type batteries are warranted for 90-days), or any product or parts which have been subject to misuse, neglect, accident, or abnormal conditions of operations.

In the event of failure of a product covered by this warranty, John Fluke Mfg. Co., Inc., will repair and calibrate an instrument returned to an authorized Service Facility within 1 year of the original purchase; provided the warrantor's examination discloses to its satisfaction that the product was defective. The warrantor may, at its option, replace the product in lieu of repair. With regard to any instrument returned within 1 year of the original purchase, said repairs or replacement will be made without charge. If the failure has been caused by misuse, neglect, accident, or abnormal conditions of operations, repairs will be billed at a nominal cost. In such case, an estimate will be submitted before work is started, if requested.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS, OR ADEQUACY FOR ANY PARTICULAR PURPOSE OR USE. JOHN FLUKE MFG. CO., INC., SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, TORT, OR OTHERWISE.

If any failure occurs, the following steps should be taken:

1. Notify the JOHN FLUKE MFG. CO., INC., or nearest Service facility, giving full details of the difficulty, and include the model number, type number, and serial number. On receipt of this information, service data, or shipping instructions will be forwarded to you.

2. On receipt of the shipping instructions, forward the instrument, transportation prepaid. Repairs will be made at the Service Facility and the instrument returned, transportation prepaid.

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT

All shipments of JOHN FLUKE MFG. CO., INC., instruments should be made via United Parcel Service or "Best Way"* prepaid. The instrument should be shipped in the original packing carton; or if it is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the instrument should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material.

CLAIM FOR DAMAGE IN SHIPMENT TO ORIGINAL PURCHASER

The instrument should be thoroughly inspected immediately upon original delivery to purchaser. All material in the container should be checked against the enclosed packing list. The manufacturer will not be responsible for shortages against the packing sheet unless notified immediately. If the instrument is damaged in any way, a claim should be filed with the carrier immediately. (To obtain a quotation to repair shipment damage, contact the nearest Fluke Technical Center.) Final claim and negotiations with the carrier must be completed by the customer.

The JOHN FLUKE MFG. CO., INC. will be happy to answer all applications or use questions, which will enhance your use of this instrument. Please address your requests or correspondence to: JOHN FLUKE MFG. CO., INC., P.O. BOX C9090, EVERETT, WASHINGTON 98206, ATTN: Sales Dept. For European Customers: Fluke (Holland) B.V., P.O. Box 5053, 5004 EB, Tilburg, The Netherlands.

*For European customers, Air Freight prepaid.

John Fluke Mfg. Co., Inc., P.O. Box C9090, Everett, Washington 98206

Rev. 6/81

www.manualsplus.com
1028649

SE Laboratories
LOC: 004
MAN – 08624